

CLAIMS

1. An image forming apparatus comprising:
a moving body provided with a plurality of attach/detach
5 sections, wherein a developing unit is attachable to and
detachable from each of said attach/detach sections, and said
developing unit has a developer containing section and an
element with which communication is possible;
a photoconductor on which a latent image can be formed;
10 and
an antenna for wirelessly communicating with said
element of the developing unit attached to the attach/detach
section;
wherein a longitudinal direction of said antenna is in
15 a direction of movement of said moving body.
2. An image forming apparatus according to claim 1, wherein
said moving body moves rotatively.
- 20 3. An image forming apparatus according to claim 1, wherein
a length of said antenna in said longitudinal direction
is longer than a length of said element in said longitudinal
direction.
- 25 4. An image forming apparatus according to claim 1, wherein
said antenna is provided at a position that is in
opposition to and extending over a first developing unit
attached to a first attach/detach section and a second
developing unit attached to a second attach/detach section
30 that is adjacent to said first attach/detach section.

5. An image forming apparatus according to claim 4, wherein
said antenna is provided at a position that is in
opposition to at least either one of a first element provided
5 in/on said first developing unit or a second element provided
in/on said second developing unit.
6. An image forming apparatus according to claim 2, wherein
said antenna is provided more to the outside than said
10 element in a radial direction of rotation of said moving body.
7. An image forming apparatus according to claim 2, wherein
said antenna is provided more to the outside than said
element in a direction of a rotation axis of said moving body.
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8. An image forming apparatus according to claim 1, wherein
said antenna is capable of wirelessly communicating with
said element of the developing unit that is moving.
- 20 9. An image forming apparatus according to claim 8, wherein
said antenna is used to write information wirelessly
into said element of the developing unit that is moving.
10. An image forming apparatus according to claim 1, wherein
25 said antenna is capable of communicating with said
element in a non-contact state with respect to said element.
11. An image forming apparatus according to claim 1, wherein
said antenna is used to write, into said element,
30 information indicating a remaining amount of developer

contained in the developing unit provided with that element.

12. An image forming apparatus according to claim 1, wherein
said antenna writes, into said element, information
5 indicating a usage amount of developer contained in the
developing unit provided with that element.

13. An image forming apparatus according to claim 1, wherein:
said image forming apparatus comprises an AC voltage
10 supply section for supplying an AC voltage; and
during a period from a start to an end of an image forming
process, said image forming apparatus writes information into
said element of the developing unit attached to said
attach/detach section using said antenna when said AC voltage
15 supply section is not supplying an AC voltage.

14. An image forming apparatus according to claim 13,
wherein:
said developing unit has a developer bearing body for
20 bearing developer; and
said AC voltage supply section supplies an AC voltage
to said developer bearing body.

15. An image forming apparatus according to claim 13,
25 wherein:
said image forming apparatus comprises a charging member
for charging said photoconductor; and
said AC voltage supply section supplies an AC voltage
to said charging member.

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16. An image forming apparatus according to claim 1, wherein:
said image forming apparatus comprises an attach/detach opening through which said developing unit is attached to and detached from said attach/detach section;

5 in a state in which said developing unit is positioned at an opposing position where said developing unit is in opposition to said photoconductor due to movement of said moving body, development of said latent image with the developer contained in said developing unit is possible;

10 in a state in which said developing unit is positioned at a detaching position that is different from said opposing position due to movement of said moving body, detachment of said developing unit from said attach/detach section via said attach/detach opening is possible; and

15 during a period from when said developing unit arrives at said opposing position until when said developing unit arrives at said detaching position due to movement of said moving body, said image forming apparatus writes information into said element of said developing unit using said antenna.

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17. An image forming apparatus according to claim 13, wherein
a difference between a maximum voltage value and a minimum voltage value of said AC voltage is 1000 volts or more.

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18. An image forming apparatus comprising:

a moving body provided with a plurality of attach/detach sections, wherein a developing unit is attachable to and detachable from each of said attach/detach sections, and said
30 developing unit has a developer containing section and an

element with which communication is possible;

a photoconductor on which a latent image can be formed;
and

an antenna for wirelessly communicating with said
5 element of the developing unit attached to the attach/detach
section, wherein:

a longitudinal direction of said antenna is in a
direction of movement of said moving body;

said moving body moves rotatively;

10 a length of said antenna in said longitudinal direction
is longer than a length of said element in said longitudinal
direction;

said antenna is provided at a position that is in
opposition to and extending over a first developing unit
15 attached to a first attach/detach section and a second
developing unit attached to a second attach/detach section
that is adjacent to said first attach/detach section;

said antenna is provided at a position that is in
opposition to at least either one of a first element provided
20 in/on said first developing unit or a second element provided
in/on said second developing unit;

said antenna is capable of wirelessly communicating with
said element of the developing unit that is moving;

said antenna is capable of communicating with said
25 element in a non-contact state with respect to said element;
and

said antenna is used to write, into said element,
information indicating a remaining amount or a usage amount
of developer contained in the developing unit provided with
30 that element.

19. A developing unit comprising:

a developer containing section; and

an element with which communication is possible,

5 wherein:

said developing unit is capable of being attached to
and detached from an attach/detach section of a main body
of an image forming apparatus that includes: a moving body
provided with a plurality of the attach/detach sections, said
10 developing unit being attachable to and detachable from one
of said attach/detach sections; a photoconductor on which
a latent image can be formed; and an antenna for wirelessly
communicating with said element of the developing unit
attached to the attach/detach section; and

15 a longitudinal direction of said element is in a
longitudinal direction of said antenna when said developing
unit is attached to said attach/detach section.

20. A developing unit according to claim 19, wherein

20 said developing unit is capable of being attached to
said attach/detach section of said moving body which moves
rotatively.

21. A developing unit according to claim 19, wherein

25 a length of said element in said longitudinal direction
is shorter than a length of said antenna in said longitudinal
direction.

22. A developing unit according to claim 19, wherein

30 said element is capable of communicating with said

antenna in a non-contact state with respect to said antenna.

23. A developing unit according to claim 19, wherein
said element stores information indicating a remaining
5 amount of developer contained in the developing unit provided
with that element.

24. A developing unit according to claim 19, wherein
said element stores information indicating a usage
10 amount of developer contained in the developing unit provided
with that element.

25. A developing unit comprising:
an element with which communication is possible using
15 an antenna; and
a developer containing section for containing developer,
wherein
a longitudinal direction of said antenna intersects with
a longitudinal direction of said developing unit.

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26. A computer system comprising:
a computer unit; and
an image forming apparatus that is connected to said
computer unit and that includes

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a moving body provided with a plurality of
attach/detach sections, wherein a developing unit
is attachable to and detachable from each of said
attach/detach sections, and said developing unit
has a developer containing section and an element
30 with which communication is possible,

a photoconductor on which a latent image
can be formed, and
an antenna for wirelessly communicating
with said element of the developing unit attached
5 to the attach/detach section,
wherein a longitudinal direction of said antenna is in
a direction of movement of said moving body.

27. An image forming apparatus comprising:
10 a moving body provided with a plurality of attach/detach
sections, wherein a developing unit is attachable to and
detachable from each of said attach/detach sections, and said
developing unit has a developer containing section and an
element into which information can be written;
15 a photoconductor on which a latent image can be formed;
a writing member for writing information into said
element; and
an attach/detach opening through which said developing
unit is attached to and detached from the attach/detach section,
20 wherein:
in a state in which said developing unit is positioned
at an opposing position where said developing unit is in
opposition to said photoconductor due to movement of said
moving body, development of said latent image with the
25 developer contained in said developing unit is possible;
in a state in which said developing unit is positioned
at a detaching position that is different from said opposing
position due to movement of said moving body, detachment of
said developing unit from said attach/detach section via said
30 attach/detach opening is possible; and

during a period from when said developing unit arrives at said opposing position until when said developing unit arrives at said detaching position due to movement of said moving body, said writing member writes information into said element of said developing unit.

28. An image forming apparatus according to claim 27, wherein during a period from when a developer bearing body provided in the developing unit that has arrived at said opposing position ends developing said latent image until when said developing unit arrives at said detaching position, said writing member writes information into said element of said developing unit.

29. An image forming apparatus according to claim 28, wherein during a period from when said developing unit starts moving from said opposing position until when said developing unit arrives at said detaching position due to movement of said moving body, said writing member writes information into said element of said developing unit.

30. An image forming apparatus according to claim 27, wherein if, during the period from when said developing unit starts moving from said opposing position until when said developing unit arrives at said detaching position, another developing unit adjacent to said developing unit on the upstream side therefrom in a direction of movement of said moving body is to arrive at said opposing position, then said writing member writes information into said element of said developing unit during a period until said other

developing unit arrives at said opposing position.

31. An image forming apparatus according to claim 27,
wherein:

5 said image forming apparatus comprises an AC voltage
supply section for supplying an AC voltage; and
 said writing member writes information into said element
of the developing unit attached to said attach/detach section
when said AC voltage supply section is not supplying an AC
10 voltage.

32. An image forming apparatus according to claim 31,
wherein:

 said developing unit has a developer bearing body for
15 bearing developer; and
 said AC voltage supply section supplies an AC voltage
to said developer bearing body.

33. An image forming apparatus according to claim 31,
20 wherein:

 said image forming apparatus comprises a charging member
for charging said photoconductor; and
 said AC voltage supply section supplies an AC voltage
to said charging member.

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34. An image forming apparatus according to claim 27, wherein
 said writing member writes information into said element
in a non-contact state with respect to said element.

30 35. An image forming apparatus according to claim 31, wherein

a difference between a maximum voltage value and a minimum voltage value of said AC voltage is 1000 volts or more.

5 36. An image forming apparatus according to claim 27, wherein said writing member writes, into said element, information indicating a remaining amount of developer contained in the developing unit provided with said element.

10 37. An image forming apparatus according to claim 27, wherein said writing member writes, into said element, information indicating a usage amount of developer contained in the developing unit provided with said element.

15 38. An image forming apparatus comprising:

a moving body provided with a plurality of attach/detach sections, wherein a developing unit is attachable to and detachable from each of said attach/detach sections, and said developing unit has a developer containing section and an
20 element into which information can be written;

a photoconductor on which a latent image can be formed;

a writing member for writing information into said element; and

an attach/detach opening through which said developing
25 unit is attached to and detached from the attach/detach section, wherein:

in a state in which said developing unit is positioned at an opposing position where said developing unit is in opposition to said photoconductor due to movement of said
30 moving body, development of said latent image with the

developer contained in said developing unit is possible;

in a state in which said developing unit is positioned at a detaching position that is different from said opposing position due to movement of said moving body, detachment of
5 said developing unit from said attach/detach section via said attach/detach opening is possible;

during a period from when said developing unit starts moving from said opposing position until when said developing unit arrives at said detaching position due to movement of
10 said moving body, said writing member writes information into said element of said developing unit;

if, during the period from when said developing unit starts moving from said opposing position until when said developing unit arrives at said detaching position, another
15 developing unit adjacent to said developing unit on the upstream side therefrom in a direction of movement of said moving body is to arrive at said opposing position, then

said writing member writes information into said element of said developing unit during a period until said other
20 developing unit arrives at said opposing position;

said developing unit has a developer bearing body for bearing developer;

said image forming apparatus comprises an AC voltage supply section for supplying an AC voltage;

25 said AC voltage supply section supplies an AC voltage to said developer bearing body;

said writing member writes information into said element of the developing unit attached to said attach/detach section when said AC voltage supply section is not supplying an AC
30 voltage to said developer bearing body;

said writing member writes information into said element
in a non-contact state with respect to said element;

a difference between a maximum voltage value and a
minimum voltage value of said AC voltage is 1000 volts or
5 more; and

said writing member writes, into said element,
information indicating a remaining amount or a usage amount
of developer contained in the developing unit provided with
said element.

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39. An image forming apparatus comprising:

a moving body provided with a plurality of developing
unit attach/detach sections, wherein a developing unit having
a developer containing section is attachable to and detachable
15 from each of said developing unit attach/detach sections;

a photoconductor unit attach/detach section to and from
which a photoconductor unit can be attached and detached,
wherein said photoconductor unit has a photoconductor and
an element into which information can be written;

20 a writing member for writing information into said
element; and

an attach/detach opening through which said developing
unit is attached to and detached from the attach/detach section,
wherein:

25 in a state in which said developing unit is positioned
at an opposing position where said developing unit is in
opposition to said photoconductor due to movement of said
moving body, development of a latent image formed on said
photoconductor with the developer contained in said developing
30 unit is possible;

in a state in which said developing unit is positioned at a detaching position that is different from said opposing position due to movement of said moving body, detachment of said developing unit from said developing unit attach/detach section via said attach/detach opening is possible; and

during a period from when said developing unit arrives at said opposing position until when said developing unit arrives at said detaching position due to movement of said moving body, said writing member writes information into said element of said photoconductor unit.

40. An image forming apparatus according to claim 39, wherein during a period from when a developer bearing body provided in the developing unit that has arrived at said opposing position ends developing said latent image until when said developing unit arrives at said detaching position, said writing member writes information into said element of said photoconductor unit.

41. An image forming apparatus according to claim 40, wherein during a period from when said developing unit starts moving from said opposing position until when said developing unit arrives at said detaching position due to movement of said moving body, said writing member writes information into said element of said photoconductor unit.

42. An image forming apparatus according to claim 39, wherein if, during the period from when said developing unit starts moving from said opposing position until when said developing unit arrives at said detaching position, another

developing unit adjacent to said developing unit on the upstream side therefrom in a direction of movement of said moving body is to arrive at said opposing position, then
said writing member writes information into said element
5 of said photoconductor unit during a period until said other developing unit arrives at said opposing position.

43. An image forming apparatus according to claim 39, wherein:

10 said image forming apparatus comprises an AC voltage supply section for supplying an AC voltage; and
said writing member writes information into said element of said photoconductor unit attached to said photoconductor unit attach/detach section when said AC voltage supply section
15 is not supplying an AC voltage.

44. An image forming apparatus according to claim 43, wherein:

said developing unit has a developer bearing body for
20 bearing developer; and
said AC voltage supply section supplies an AC voltage to said developer bearing body.

45. An image forming apparatus according to claim 43, wherein:

said image forming apparatus comprises a charging member for charging said photoconductor; and
said AC voltage supply section supplies an AC voltage to said charging member.

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46. An image forming apparatus according to claim 39, wherein
said writing member writes information into said element
in a non-contact state with respect to said element.
- 5 47. An image forming apparatus according to claim 43, wherein
a difference between a maximum voltage value and a
minimum voltage value of said AC voltage is 1000 volts or
more.
- 10 48. An image forming apparatus according to claim 39, wherein
said writing member writes, into said element,
information indicating a remaining amount of developer
contained in the developing unit.
- 15 49. An image forming apparatus according to claim 39, wherein
said writing member writes, into said element,
information indicating a usage amount of developer contained
in the developing unit provided with said element.
- 20 50. A computer system comprising:
a computer unit; and
an image forming apparatus that is connected to said
computer unit and that includes
a moving body provided with a plurality of
25 attach/detach sections, wherein a developing unit
is attachable to and detachable from each of said
attach/detach sections, and said developing unit
has a developer containing section and an element
into which information can be written;
30 a photoconductor on which a latent image

can be formed;

a writing member for writing information
into said element; and

an attach/detach opening through which said
5 developing unit is attached to and detached from
the attach/detach section;

wherein, in a state in which said developing
unit is positioned at an opposing position where
said developing unit is in opposition to said
10 photoconductor due to movement of said moving body,
development of said latent image with the
developer contained in said developing unit is
possible; and

wherein, in a state in which said developing
15 unit is positioned at a detaching position that
is different from said opposing position due to
movement of said moving body, detachment of said
developing unit from said attach/detach section
via said attach/detach opening is possible;

20 wherein, during a period from when said developing unit
arrives at said opposing position until when said developing
unit arrives at said detaching position due to movement of
said moving body, said writing member writes information into
said element of said developing unit.

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51. A computer system comprising:

a computer unit; and

an image forming apparatus that is connected to said
computer unit and that includes

30 a moving body provided with a plurality of

developing unit attach/detach sections, wherein
a developing unit having a developer containing
section is attachable to and detachable from each
of said developing unit attach/detach sections;
5 a photoconductor unit attach/detach
section to and from which a photoconductor unit
can be attached and detached, wherein said
photoconductor unit has a photoconductor and an
element into which information can be written;
10 a writing member for writing information
into said element; and
 an attach/detach opening through which said
developing unit is attached to and detached from
the attach/detach section;
15 wherein, in a state in which said developing
unit is positioned at an opposing position where
said developing unit is in opposition to said
photoconductor due to movement of said moving body,
development of a latent image formed on said
20 photoconductor with the developer contained in
said developing unit is possible; and
 wherein, in a state in which said developing
unit is positioned at a detaching position that
is different from said opposing position due to
25 movement of said moving body, detachment of said
developing unit from said developing unit
attach/detach section via said attach/detach
opening is possible;
 wherein, during a period from when said developing unit
30 arrives at said opposing position until when said developing

unit arrives at said detaching position due to movement of said moving body, said writing member writes information into said element of said photoconductor unit.